AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of quenching a material, comprising the steps of:

providing a <u>nickel alloy</u> material having a first section and a second section; and

impingement cooling said first section with a fluid to increase a cooling rate of said first section relative to a cooling rate of said second section;

wherein impingement cooling is a subset of forced convection cooling that produces significantly higher heat transfer coefficients than the remainder of the forced convection regime.

2. (Original) The method as recited in claim 1, wherein said fluid comprises a gas.

3. (Original) The method as recited in claim 1, wherein said propelling step generally minimizes a gradient between a temperature of said first section and a temperature of said second section.

4. (Canceled)

5. (Original) The method as recited in claim 1, wherein the propelling step remains constant during quenching.

6. (Original) The method as recited in claim 1, wherein the propelling step varies during quenching.

7. (Original) The method as recited in claim 6, wherein the propelling step varies by adjusting a pressure of said fluid.

8. (Currently Amended) A method of adjusting the cooling rate of a forging during quenching, comprising the steps of:

providing a <u>nickel alloy</u> forging having a first section with a first cooling rate and a second section having a second cooling rate; and

impingement cooling said first section with a fluid in order to minimize a differential between said first cooling rate and said second cooling rate;

wherein impingement cooling is a subset of forced convection cooling that produces significantly higher heat transfer coefficients than the remainder of the forced convection regime.

9. (Original) The method as recited in claim 8, wherein said fluid is a gas.

10. (Original) The method as recited in claim 8, wherein said propelling step generally minimizes a gradient between a temperature of said first section and a temperature of said second section.

11. (Canceled)

12. (Original) The method as recited in claim 8, wherein the propelling step remains constant during quenching.

13. (Original) The method as recited in claim 8, wherein the propelling step varies during quenching.

14. (Original) The method as recited in claim 13, wherein the propelling step varies by adjusting a pressure of said fluid.

15. (Currently Amended) ~~An~~ A combination of a nickel alloy material and an apparatus for quenching ~~a~~ said material, the material having a first section and a second section, said apparatus comprising:

a support for receiving the material; and

an outlet having a size and a location adjacent said support such that a fluid exiting said outlet impingement cools the first section of the material, so that a cooling rate of the first section increases relative to a cooling rate of the second section;

wherein impingement cooling is a subset of forced convection cooling that produces significantly higher heat transfer coefficients than the remainder of the forced convection regime.

16. (Currently Amended) The ~~apparatus~~ combination as recited in claim 15, wherein said outlet has a diameter (d) and is positioned a distance (Z) from the material placed in said support, and Z/d is between approximately 1.0 and 6.0.

17. (Currently Amended) The ~~apparatus~~ combination as recited in claim 15, wherein said outlet comprises a plurality of outlets each having a diameter (d), adjacent outlets having a spacing (s) therebetween, and s/d is less than approximately 26.0.

18. (Currently Amended) The ~~apparatus~~ combination as recited in claim 17, wherein said spacing is a circumferential spacing (X) and X/d is less than approximately 26.0.

19. (Currently Amended) The ~~apparatus~~ combination as recited in claim 17, wherein said spacing is a radial spacing (Y) and Y/d is less than approximately 24.0.

20. (Currently Amended) The ~~apparatus~~ combination as recited in claim 15, wherein said outlet comprises a plurality of outlets in an annular pipe.

21. (Previously Presented) The method as recited in claim 1, further comprising the step of impingement cooling said second section.

22. (Previously Presented) The method as recited in claim 8, further comprising the step of impingement cooling said second section.

23. (Previously Presented) The method as recited in claim 1, wherein said impingement cooling step produces heat transfer coefficients up to approximately 300 BTU/hr ft^2 °F.

24. (Previously Presented) The method as recited in claim 1, wherein said first section has a low surface area to volume ratio.

25. (Previously Presented) The method as recited in claim 1, wherein said first section is a larger volumetric section than said second section.

26. (Previously Presented) The method as recited in claim 8, wherein said impingement cooling step produces heat transfer coefficients up to approximately 300 BTU/hr ft^2 °F.

27. (Previously Presented) The method as recited in claim 8, wherein said first section has a low surface area to volume ratio.

28. (Previously Presented) The method as recited in claim 8, wherein said first section is a larger volumetric section than said second section.

29. (Currently Amended) The ~~apparatus~~ <u>combination</u> as recited in claim 15, wherein said impingement cooling step produces heat transfer coefficients up to approximately 300 BTU/hr ft^2 °F.

30. (Currently Amended) The ~~apparatus~~ <u>combination</u> as recited in claim 20, wherein said outlet further comprises a plurality of outlets in a central section.

31. (Currently Amended) A method of quenching a material, comprising the steps of:

providing a <u>nickel alloy</u> material having a first section and a second section; and

cooling said first section with a gas to increase a cooling rate of said first section relative to a cooling rate of said second section;

wherein said cooling step produces heat transfer coefficients greater than those created by oil bath quenching.

32. (Previously Presented) The method as recited in claim 31, wherein said cooling step comprises impingement cooling.

33. (Previously Presented) The method as recited in claim 31, wherein said cooling step produces heat transfer coefficients up to approximately 300 BTU/hr ft^2 °F.

34.-36. (Canceled)

37. (Previously Presented) The method as recited in claim 6, wherein the material is a nickel alloy.

38. (Previously Presented) The method as recited in claim 37, wherein said impingement cooling step reduces said cooling rate once said alloy exits a temperature range of a ductility trough.

39. (Currently Amended) The ~~apparatus~~ combination as recited in claim 16 wherein d is between ~~approximately~~ 0.055" and 0.075".

40. (Currently Amended) The ~~apparatus~~ combination as recited in claim 17 wherein d is between ~~approximately~~ 0.055" and 0.075".

41. (Currently Amended) The ~~apparatus~~ combination as recited in claim 15, wherein said outlet has a diameter (d) between ~~approximately~~ 0.055" and 0.075".

42. (New) The combination of claim 15, wherein the material is a forged turbine disk.